PTO 01-[PTO 2006-3841]

Japanese Patent

Document No. H7-27430

DOUBLE WALL METAL VACUUM CONTAINER
[金属制真空二重容器]

UNITED STATES PATENT AND TRADEMARK OFFICE

Washington, D.C. April, 2006

Translated by: Schreiber Translations, Inc.

Country	:	Japan
Document No.	:	07-027430
Document Pattern	:	Utility Model
Language	:	Japanese
Inventors	:	[UNKNOWN]
Applicant	:	Zojirushi Corporation
Application Date	:	November 2, 1993
Publication Date	:	May 23, 1995
Foreign Language	:	金属制真空二重容器
English Language Title	:	**DOUBLE WALL METAL VACUUM CONTAINER**

(19) JAPANESE PATENT OFFICE (JP)
(11) Laid Open Unexamined Utility Model H7-27430
(12) Official Gazette for Kokai Patent Applications (A)
(43) Publication Date: May 23, 1995

(51) Int. Cl.[6]	Identification No.	JPO File No.	FI	Tech. Indic.
A47J 41/02	102 D			
B65D 81/38	E			

Number of claims: 4 Total Number of Pages: 4
Request for Examination: No

(21) Application No.: H5-59099
(22) Application Date: November 2, 1993

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(54) DOUBLE WALL METAL VACUUM CONTAINER

(57) [Abstract]
[Purpose] In a double wall metal vacuum container, to minimize heat loss, control vibrations of the inner container, and improve durability.
[Constitution] A double wall metal vacuum container is formed by joining a cylindrical clasp 6 which is established on the lower surface of the base of the inner container 1 to a criss-cross clasp 9 which is established on the upper surface of the base of the outer container, making contact with the periphery of the rib 7 of the inner peripheral surface of the cylindrical clasp 6 and the criss-cross clasp 9.

[Utility model registration claim]

[Claim 1] A double wall metal vacuum container comprising a metal inner container, a metal outer container and vacuumed space between wherein said inner container and said outer container are joined together by a plurality of connecting parts on the peripheries in point or linear contact.

[Claim 2] A double wall metal vacuum container comprising a metal inner container, a metal outer container and vacuumed space between wherein said inner container and said outer container are joined together with an insulator sandwiched between.

[Claim 3] A double wall metal vacuum container comprising a metal inner container and metal outer container with a vacuum space sandwiched between the inner container and outer container and there are established contacts which make point or linear contact at a plurality of locations in the peripheral direction of the common base of the inner container and outer container or make contact by means of thermal insulation of both containers and their common base, and connect on end of the overflow pipe at the discharge opening of a plug inserted in the opening of the above-mentioned inner container,, making contact with the other end of said overflow pipe at the inner surface of the base of the above-mentioned inner container.

[Claim 4] The double wall metal vacuum container as characterized in Claim 3 wherein there is a recess for receiving air at the bottom of the inside wall of said inner container.

[Brief Description of the Drawings]

[Figure 1] A cross-sectional view of Embodiment 1

[Figure 2] A decomposition perspective view of the cylinder metal clasp and crisscross metal clasp of Embodiment 1

[Figure 3] An abbreviated cross-sectional view of one part of Embodiment 2.

[Figure 4] An abbreviated cross-sectional view of one part of Embodiment 3.

[Figure 5] An abbreviated cross-sectional view of one part of Embodiment 4.

[Figure 6] An abbreviated cross-sectional view of one part of Embodiment 5.

[Figure 7] An abbreviated cross-sectional view of one part of Embodiment 6.

[Figure 8] An abbreviated cross-sectional view of one part of Embodiment 7.

[Figure 9] A cross-sectional view of Embodiment 8

[Figure 10] An abbreviated cross-sectional view of one part of Embodiment 9.

[Description of Symbols]

1 Inner container

2 Outer Container

3 3' Opening

5 Flange

6 6' Cylindrical metal clasp

7 7' Rib

8 Hole

9 Crisscross metal clasp

11 End Plate

12 Heat Insulator

13 Recess

14 Hole

15 Cover Cap

16 16' Projected part

17 17' Recess

18 Heat Insulator

19 Bulge Section

21 Projection

22 Rubber Stopper

23 Intake Opening

24 Outtake Opening

25 Adapter

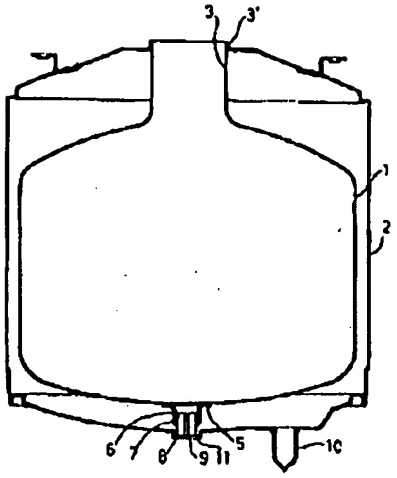
26 Overflow Pipe

27 Opening

28 Air layer

29 Recess

【図1】



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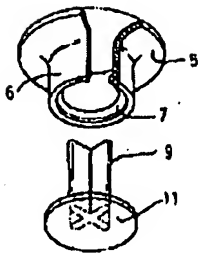

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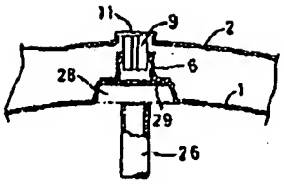

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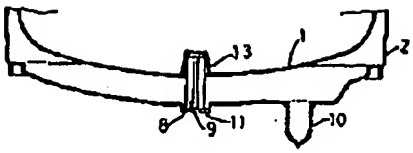

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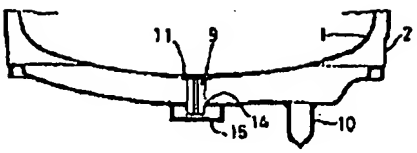

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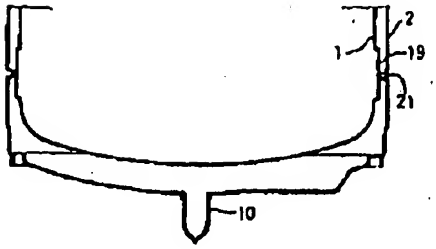

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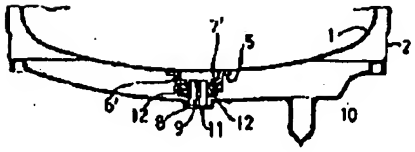

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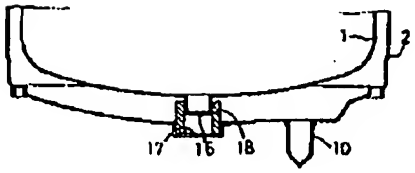

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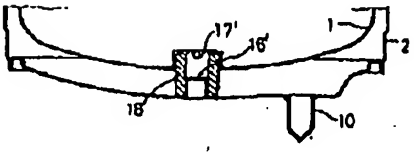

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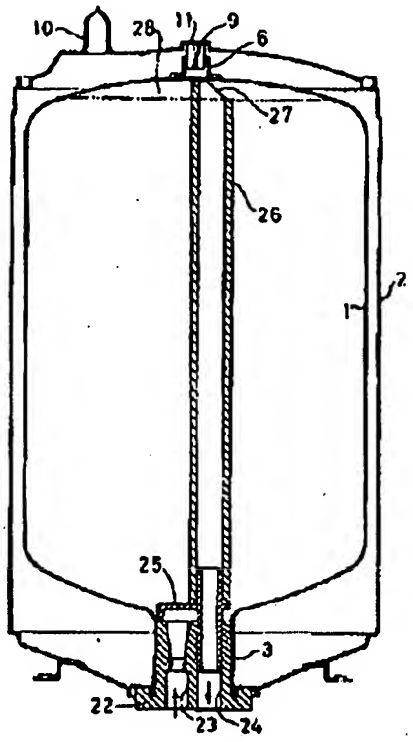

[Detailed Explanation of the Design]

[0001]

[Industrial Application]

This design is related to a double wall metal vacuum container.

[0002]

[Description of the Prior Art]

While metals, such as stainless steel, constitute the container of the dual structure of an inner container and an outer container and carrying out the junction unification of the opening peripheral edge of both inner and outer containers, the double wall metal vacuum container which made the vacuum the space section between both the inner and outer containers is known from the former. Moreover, in order that the joint in the opening peripheral edge of both the inner and outer containers may prevent damage by the impact or vibration, to the metal clasps with a hole attached in the inferior surface of a projection of the inner container, the cartridge metal clasps attached in the base of an outer container are set, some gap is inserted, and there is restricted vibration of the inner container by impact etc. to the range of the above-mentioned gap as is known (refer to JP61-168322A).

[0003]

[Problem(s) to be Solved by the Device]

However, within the limits of the gap between the metal clasps of both containers, when it is used having installed in a location in which there are regular vibrations, since there was some gap between both containers and even with metal clasps which represented measures against impacts as mentioned above, since the inner container always vibrated,

the joint was damaged at an early stage and there was a problem with durability.

[0004]

This design solves a technical problem by offering a double wall metal vacuum container with impact-proofing and with excellent durability, vibration-proofing, heat loss control to the minimum.

[0005]

[Means for Solving the Problem]

The 1st design for solving the above-mentioned technical problem has a dual structure of a metal inner container and an outer container, and considers both as being in point contact or a configuration which is carried out through line contact in two or more places in the peripheral direction between the above-mentioned inner container and an outer container in a double wall metal vacuum container which makes the space section between both the inner and outer containers into a vacuum.

[0006]

The 2nd design has a dual structure of a metal inner container and an outer container, and considers the above-mentioned inner container and an outer container in a configuration contacted through the heat insulator in the double wall metal vacuum container which comes to make the space section between both inner and outer containers into a vacuum.

[0007]

The double wall metal vacuum container of the 3rd design has the dual structure of a metal inner container and an outer container, and makes the space section between both inner and outer containers into a vacuum through point contact or the contact section in which line contact is carried out or both the peripheral edges of both containers are

contacted through a heat insulator in two or more places in the peripheral direction for both an inner container, and an outer container. It considers the configuration in which the end of an overflow pipe was connected an opening of the plug inserted in the opening of the above-mentioned inner container, and the other end of this overflow pipe was connected to the bottom side of the above-mentioned inner container.

[0008]

The 4th design is considered as the configuration in which there is established a recess for air accumulation at the inner surface of the base of said inner container as in the 3rd design.

[0009]

[Function]

Concerning the 1st design, vibration is regulated at two or more point contacts or on the line contact part to which a inner container exists in the peripheral direction. Moreover, as for the 2nd design, vibration of a inner container is similarly regulated through a heat insulator.

[0010]

Moreover, the 3rd design has the same operation as the 1st and 2nd designs, and also if an open side is used downward, turning it, an air space will produce the vacuum duplex container between overflow-pipe upper limit and the inner container's bottom side, and the air space gives heat insulation over the contact section.

[0011]

The 4th design also turns and uses an opening side downward, and an air space will be made in the recess, giving heat insulation over the contact section.

[0012]

[Embodiment]

The 1st embodiment shown in Figure 1 is an embodiment of the 1st design, and has a dual structure of the inner container 1 made from stainless steel, and an outer container 2, and carries out the junction unification of opening 3' of an outer container 2 by welding on the peripheral edge of the opening 3 of the inner container 1.

[0013]

The flange 5 of the cylinder metal clasps 6 (refer to Figure 2) which have a flange 5 on the bottom subordinate side of the above-mentioned inner container 1 is joined by welding. A rib 7 is formed in the cylindrical peripheral surfaces of these cylinder metal clasps 6. The crisscross metal clasps 9 (refer to Figure 2) were inserted in the hole 8 established in the opening of the outer container 2, and the end plate 11 formed in the lower limit of the crisscross metal clasps 9 is joined to the surroundings of a hole 8 on a bottom subordinate side.

[0014]

The above-mentioned crisscross metal clasps 9 are inserted into the cylinder metal clasps 6 of the inner container 1, and each side of the four pieces in the vertical direction are combined with the cross-joint form point contact into a cross condition to the inside of a rib 7.

[0015]

The air of the space part between the above-mentioned inner container 1 and the outer container 2 is eliminated from the part of the chip 10, and is held by obstructing this chip 10 by a vacuum.

[0016]

Even if there is dislodging of the double wall metal vacuum container of the 1st embodiment, and impact and vibration occurs for the inner container 1, it is regulated so that there is radial vibration to an outer container 2, and it does not affect the bonding strength of the openings 3 and 3'. Moreover, since contact between both the metal clasps 6 and 9 is point contact, heat transfer between both the containers 1 and 2 is suppressed to the minimum.

[0017]

The 2nd embodiment shown Figure 3 forms the recess 13 of the shape of a taper as in other embodiments of the 1st design and carries out entry to the inner container 1 in the inner direction, inserts in the above-mentioned recess 13 the crisscross metal clasp 9 joined to the base part of an outer container 2, and carries out point contact of four pieces of points of the crisscross metal clasps 9 to the inside of the above-mentioned recess 13. There is an advantage in that only one metal clasp is sufficient, one of the crisscross metal clasps 9 compared with the number required by the 1st embodiment.

[0018]

The 3rd embodiment shown in Figure 4 as in the 1st design, joins the crisscross metal clasp 9 to the bottom subordinate side of the inner container 1, inserts this in the hole 14 of the base part of the outer container 2, and it effects point contact to the inner side of the hole 14. Moreover, the cover cap 15 is joined at the tip of the above-mentioned hole 14 and the crisscross metal clasp 9 to the bottom inside side of an outer container 2. There is an advantage in that only one metal clasp is sufficient.

[0019]

The 4th embodiment shown in Figure 5 carries out point contact of the projection 21 to the above-mentioned bulge section 19 of the plurality of inward directions which is part of the embodiment of the 1st design, forming the bulge section 19 in the body section of the inner container 1, and was formed in the body section of the outer container 2.

[0020]

The 5th embodiment shown in Figure 6 is an embodiment of the 2nd design, and it inserts the crisscross metal clasp 9 in the inside of the heat insulator 12 while it supports the annular heat insulator 12 which is fitted into the inside of the cylinder metal clasps 6 by rib 7'. In this case, while vibration of the inner container 1 is regulated, it becomes still smaller than if there were heat transfer between both the metal clasps 6 and 9 as in said 1st design.

[0021]

The 6th embodiment shown in Figure 7 is another embodiment of the 2nd design, and it counters the base part of the outer container 2 with the above-mentioned projected part 16, and forms the recess 17 along the major diameter, fits the upper limit section of the heat insulator 18 of a cartridge into the peripheral face of the above-mentioned projected part 16, and fits the lower limit section into the inner skin of the above-mentioned recess 17 while it forms a projected part 16 in the bottom side of the inner container 1. Vibration of the inner container 1 is transmitted to the outer container 2 through the above-mentioned heat insulator 18.

[0022]

With other embodiments of the 2nd design, and the recess 17' with major diameter is formed in the inner container 1, and it forms a projected part 16' of a minor diameter in

the outer container 2, and the 7th embodiment shown in Figure 8 fits the cylindrical shape heat insulator 18 into the inner skin of above-mentioned recess 17' and the peripheral face of the projected part 16', and operates in the same way as with the 5th embodiment.

[0023]

With embodiment 8 as with embodiment 3 shown in Figure 9, the bracing prevention means of the inner container 1 uses the cylindrical shape metal clasps 6 and the crisscross metal clasps 9 as in the 1st above-mentioned embodiment.

The rubber stopper 22 is inserted in the opening 3 of the inner container 1 in this 8th embodiment. The rubber stopper 22 had the opening 23 and the flood opening 24, and has connected the overflow pipe 26 to the flood opening 24 through the adapter 25. The upper limit of this overflow pipe 26 approaches the base of the inner container 1, and the opening 27 forming an inclination in the upper limit section is opened wide in the inner container 1.

[0024]

The vacuum duplex container of the 8th embodiment installs by turning the opening 3 side of the inner container 1 down, and is used in that way. In this case, if the level of the water put in the inner container 1 reaches the opening 27 of the overflow pipe 26's upper-limit section, since water will be overflow, the fixed air space 28 always exists in the upper limit section (bottom surface part) of the inner container 1. Therefore, the air space 28 gives insulation for heat transfer from the contact part of the cylinder metal clasps 6 and the crisscross metal clasps 9 to the liquid in the inner container 1.

[0025]

The 9th embodiment shown in Figure 10 is an embodiment of the 4th design, and

establishes the recess 29 for air accumulation which carries out a reentry in the direction of the outer container 2 at the base of the inner container 1, and makes the upper limit of an overflow pipe 26 face the recess 29. The cylinder metal clasps 6 fix to the opposite side of this recess 29, and constitute the contact section between the crisscross metal clasps 9 of an outer container 2.

[0026]

If the opening 3 is installed downward also in this case, water is fills in the inner container 1, the interior of a recess 29 will serve as an air space 28, and that part will provide heat insulation.

[0027]

[Effect of the Device]

As mentioned above, since vibration of the inner container is controlled by two or more sites in the peripheral direction in a inner container and an outer container, even if impact and vibration are added at point contact or by line contact, the 1st design of this application is effective in improving durability. Moreover, since both containers only touch by point contact or line contact, heat transfer between both containers is controlled to the minimum. Heat transfer of the 2nd design decreases further by mediation of a heat insulator while vibration of the inner container is controlled.

[0028]

Heat transfer is controlled and a vacuum provides insulation in the 3rd and 4th designs inside the contact section of a inner container and an outer container when used.